THE AMERICAN ARCHITECT AND BUILDING NEWS.

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THE exhibition of architectural drawings at the Centennial Exhibition may be said, perhaps, to be more representative than complete. There was a good deal of backwardness and negligence among architects in offering drawings; the number sent is not very great, and not more than half the better-known members of the profession are represented. Nevertheless there are drawings enough to fill the walls of one of the smaller rooms in the *Annexe* of the Memorial Building, and to cover the screens with which it is subdivided. New York and Boston furnish the greater proportion of the drawings exhibited; Philadelphia is not largely represented, and the rest of the collection is sporadic. The average, on the whole, may be said to be more than respectable. There are few designs of great pretension, and there is an agreeable absence of highly colored and pretentious drawings. It is likely that the committee in charge exercised some freedom in rejection, for the proportion of really bad work is small; and it is not very likely that the bad workmen kept their designs at home any more generally than the good ones. There is a considerable proportion of pen-and-ink work: most of the drawings are cleverly done, and those in pen and ink, on the whole, better than the washed or colored drawings. The lack of interiors is notable, and there is almost no show of color decoration. There is a fair amount of very good things; though the best architectural work of the country is not fairly represented, nor is the worst. The exhibition is not a thing to be proud of; but there is material in the country for a far worse one. Architects who saw the difficulty there was in collecting designs to be sent to Philadelphia will not be surprised at the result.

THE exhibition of paintings is as yet by no means in order. The American pictures are in place, and are naturally very much in the majority. The French pictures, after being partly hung in the *Annexe*, have been transferred to the Main Building, and are still unhung; part of them have but just arrived: some of the other foreign departments are not yet in order. It would seem that the artists' exhibition is likely to be markedly inferior to those of Paris and Vienna; as, indeed, might have been expected. The result is, that thus far the native pictures do not make the impression of inferiority that was naturally looked for. The catalogue published is very incomplete, several of the departments not being at all in order when it was made. The English and Italian pictures are not so much as mentioned in it. It will be still two or three weeks before this part of the exhibition is fully arranged, and a catalogue published by whose aid it will be possible to identify and remember the different paintings. The contribution from the British Academy of the works of its past members is one of the greatest value; and we may be very thankful for the happy idea of sending them. Of the new pictures, as far as they are displayed, the contributions of the Netherlandish and Norwegian painters seem to be the most interesting. The exhibits of the Mexicans and South Americans are a class by themselves, and show how the grand traditions of the past linger in remote corners, when the busy part of the world has forgotten them. These are almost all huge, and conceived in the most heroic vein. They suggest curiously the early aspirations in art of our own country: to look at them is, to an American of the United States, almost like seeing the back of his head in a mirror.

IT is not at all improbable that work upon the Danvers Insane Asylum, Massachusetts, may be suspended for the present. As was mentioned in the American Architect and Building News, some time ago, work has been continued upon this building, although no complete estimate has ever been made of the probable cost of the buildings; the committee, like most committees having the spending of the public money, trusting to obtain more money when the original appropriation should have been expended. After having expended nine hundred thousand dollars, — the original appropriation was six hundred thousand dollars, — they have asked for an additional appropriation of six hundred thousand dollars to complete the buildings. The Legislature is either unwilling or unable to grant so much money, but has compromised by granting four hundred and fifty thousand dollars, with the proviso, "that no expenditure shall be authorized, and no part of said appropriation shall be paid until contracts have been made with sufficient guaranty for their performance, to the satisfaction of the governor and council, for the entire completion and finishing of the hospital and all its appurtenances, ready for use and occupation, for a sum not exceeding six hundred thousand dollars." It is to be hoped that the delay and annoyance caused by this act of the Legislature will be a lesson to this and other committees whose duty it is to disburse the public money, not to begin operations until the most careful estimates and specifications have been made, and approved by a board of experts. In this particular case, the action of the Legislature is rather unfortunate, as so much time will be consumed in completing drawings and making estimates that the present favorable condition of the building market may have changed, and the money saved by making accurate estimates may only offset the increased cost of labor and materials. The matter has been referred to the attorney-general of the State, to discover whether, notwithstanding this proviso, the governor and council can approve partial contracts. If it is decided that they have this power, work can be proceeded with: otherwise things must wait; for contractors are found to be unwilling to take contracts for the entire work, as there is so much to be done that it will be a long time before the buildings are finally completed, and any rise in prices would probably inflict a heavy loss on the contractors.

THE dispute about the Chicago Court-House continues to be as amusing as ever. The county authorities seem to be indisposed to postpone building-operations until the new City Council shall have settled the rights and wrongs of the last municipal election; and therefore the Joint Committee on Public Buildings and Public Service have submitted a report recommending that the piling for the common dome of the building be proceeded with, without further delay. The county will then have to shoulder the cost of piling for the half which is to be ultimately paid for by the city, and must take its chance of recovering from the city the money so expended. It is said, that, unless this mode of operating is adopted, all building-operations on the part of the county must come to an end. The reason given by the Joint Committee is, that if the piles are driven for the county half now, and for the city half at some later day,

the concrete on the county side will be so disturbed and raised up by the piling, as to give a cant to the walls of the dome; and that this result can be avoided only by piling for the whole foundation at one and the same time. All this looks as if the dual building were to be erected by Messrs. Egan and Tilly as originally intended, and as if the proposition made by Messrs. Boyington, Bouton, etc., to build the Court-House in two years and a half for a total outlay of $2,100,000, were not to be accepted, even although they are willing to give heavy bonds for the completion of the contract as agreed upon.

THE *Prix du Salon* for the *salon* of 1876 is to be open to the concurrence of competitors from all the four sections of fine arts, — painting, sculpture, architecture, and engraving in stone. Last year this prize, the establishment of which was the subject of much reprobation and more comment, was open only to the painters. The value of the *Prix du Salon* must not be over-estimated. We remember the sneering criticisms that were heaped on the jury last year, when it was made known what painting it was that had been deemed worthy of receiving this, which from its title was very commonly and not improperly supposed to be the highest award that it was in the power of the jury to bestow. The *Prix du Salon* was established in 1874 by a ministerial decree, and is open only to young painters under thirty-two years of age, who have shown by their works that a sojourn at Rome would be profitable to them. The competitors for this prize are, then, mostly young and untried men. The prize consists, beside the honor of the award, of a sum of four thousand francs a year, which is given by the Government for the support of the recipient of the prize at Rome for the space of three years. We believe that any artist who has borne off any prize or medal at a *salon* is excluded from the competition. Moreover, the prize is so small that the best men are unwilling to enter into the competition; for one of the conditions is, that the recipient of the prize shall start immediately for Rome, although he may have much work on hand that requires him to stay at home. The prize was originally instituted to encourage the study and practice of historical painting. But last year it occurred to the jury that architects as well as painters could profit by a sojourn at Rome; and they therefore requested the Government to institute another *Prix du Salon* for architects. This appears to have resulted not, as was hoped, in the founding of another prize, but in the opening of the existing one to competitors from all branches of the fine arts.

CONCRETE BUILDING. — II.

THE Building News has lately given interest to the question of concrete-building by offering prizes for competitive designs for a villa in this material. All the projects submitmitted seem to have been for houses with walls filled in solidly between planking set up on each face of the wall. In such a treatment as this, it is necessary to clamp the planking together by rods run through the wall, and withdrawn when the concrete has set sufficiently to allow it, and to finish the wall in some kind of stucco after the mould is removed. We have already spoken of some of the difficulties in the way of this sort of work. The opportunities which it allows for scamping are almost unlimited. In fact, one of the serious causes for misgiving, in regard to buildings in which the mass of the walls is of concrete, is the difficulty of telling the quality of the work till long after it is finished. This would be no drawback to speculative builders; but to purchasers and proprietors it would be a serious matter. If such work were hastily or carelessly or unskilfully done, it might be difficult, even for a person under whose eye it was built, to find it out; and for a purchaser it might be impossible till a failure in the house, which would be likely to come without warning, showed him the weakness of it. The Building News mentions some work of this sort executed according to the process of Mr. Broughton, which shows that in England it can be built more cheaply than masonry. The cost was £7. 10*s*. 3*d*. per rod, while brick-work cost £13. 6*s*. 3½*d*. per rod, and stone-work (rubble, doubtless) with dressed quoins cost £12 17*s* 8*d*. In this case the concrete was finished in stucco. In the comparatively uniform and moderate climate of England, this might be satisfactory; but we are pretty sure that the violent frosts of the Northern United States would be too much for it. The comparison of cost, too, is to be taken with allowance, for a brick wall need not be more than two-thirds as thick as one of stone or concrete. The concrete in this case is one of comparatively coarse material, the stucco alone being fine.

The great practical advantage of fine concrete is of course the facility with which it can be moulded into the necessary forms, the shape being almost a matter of indifference so far as difficulty and expense are concerned, and the waste nothing. Large slabs, for instance, are exceedingly difficult to get and expensive in most stones, and are more costly as they are thinner, and heavier and more unmanageable as they are thicker; but in concrete they are as cheap as any other form of the material, and cheaper as well as more manageable the thinner they are. In the matter of strength to resist compressive and transverse strains, experiments on the best concretes give very satisfactory results. For instance, in a recent lecture by Mr. Payne, an English engineer, before the Civil and Mechanical Engineers' Society in London, experiments were quoted which showed that a concrete carefully made with Portland cement was stronger than Portland stone; and there is no doubt that the use of hydraulic cement makes concrete more impervious to water than most natural sandstones. It also has been found to resist the action of fire better than stone; and Mr. Payne cited a remarkable case of a building in London. It was occupied by a provision-merchant; and in the lower story a large amount of butter, cheese, and other inflammable matter was stored, above which was a concrete floor. The upper part of the building was burned; and the blazing material fell in a mass on the concrete floor, where it burned furiously for some hours before it was put out: nevertheless the floor resisted the great heat, and the things stored below it were uninjured.

Besides the use of concrete in brute mass, or in building-blocks, of which we have spoken, many ways of applying it are proposed, of which the chief involves a frame-work or support of other material, most frequently of iron, but sometimes of wood, or even of masonry. The inventions for the use of one and another concrete in combination with iron are naturally all in accordance with one of two systems, — the insertion of blocks and slabs of concrete in frames of iron, or the bedding of iron frames or skeletons in the blocks of concrete themselves. The latter process has seemed for the moment to attract most attention among the English advocates of the material; and it is proposed to build houses with a whole skeleton of light iron bars overlaid with blocks and beams of concrete. A bay window built in this way from a design of Mr. Norman Shaw, and finished entirely in concrete, down to the mullions and transoms, is cited in the English papers. English engineers favor this treatment, among them Mr. Payne in the lecture we have quoted. But it seems to us open to many objections. We will pass over, as not likely to have much weight with many advocates of concrete, the argument that this use of it is offensive to the artistic sense, as lacking in straightforwardness and genuineness. Practically, then, it involves first of all the acknowledgment that concrete so to be used is not strong enough for its ostensible duty, in spite of the claims that are urged for it of a greater strength than that of stone. In actual use we may be pretty sure that it would not be made any stronger

than would be necessary to make it hold together on the iron; for it would be a matter of great care and labor to compact it around the fixed iron frame with the solidity it should have to give it strength. It is safe, on the other hand, to assume that the solidity and cohesion necessary to give it real durability would not be more than would be required to enable it to stand alone.

In all combinations of two materials, the effects of temperature have to be guarded against with care. The advocates of the iron skeleton argue that the expansion of an iron bar imbedded in concrete would be too slight to produce any effect; but a very slight expansion and shrinkage in the interior of a rigid material may prove fatal, at least by long repetition; and moreover the expansion not only of an individual bar, but of the whole frame, is to be accounted for; and that in a climate like ours, which exposes a building to a variation of temperature of one hundred and twenty degrees or more in the course of the year, is too large a factor to be neglected. And this difficulty will be increased by the fact that the shrinkage of the concrete in setting puts it in a condition of tension from the beginning. Experience is constantly establishing unexpected things; but we should be greatly surprised to see any construction of iron overlaid with concrete prove durable in the Northern United States. Cracks and open joints would be inevitable; and, the water once let into the interior of such a structure, disintegration would be rapid. Moreover the process would be inscrutable: there would be no warning till the concrete shivered to pieces at one point or another. Nor would it be easy to replace a broken block, still less so to supply any part of the iron frame which had given out.

With concrete slabs set in an iron frame, the case is very different. Such a construction could not be so cheaply built; and, as it would be open to observation, it would not give so good a chance for scamping. Decency of appearance would require a certain degree of strength in the frame; and the concrete would be really and obviously only a filling to keep out the weather. The whole thing could be constantly watched; and a failure in the concrete need not endanger the structure, while the replacing of any damaged portion would be comparatively easy. Finally, such a construction is straightforward, intelligible, and lends itself naturally to a straightforward characteristic treatment in design. Instead of an iron frame, a wooden one has been proposed and used: in this country it is more likely to be adopted, we should think, than an iron one. A number of devices for these combinations of material have been brought forward both here and in England. A noticeable one is the invention of Mr. Lascelles, who makes a concrete of breeze (coke-dust) and cement, which can be moulded into beams and planks, and into which, he says, nails and screws can be driven as into wood. This last property would seem to be fatal to other serviceable qualities. A material into which a nail can be driven must be compressible; and a non-fibrous, inelastic, compressible material can hardly be a strong one.

Thus far, we have had in mind the exterior use of concrete. In interior work, there are many good opportunities for its use. Moulded into slabs, it is a light, sufficiently strong, and incombustible material for partitions. It might be used as a lining for exterior walls of masonry, leaving a proper air-space; and, if the slabs were fixed to the walls by studs or rivets, these might be frankly acknowledged, and would give an easy opportunity for the replacement of a damaged slab. Staircases can be, and are, made of it to advantage. It is valuable for fire-proof floors, as in the case which we have already described. In these, it has mostly been used in combination with iron beams in slabs or arches; but a floor in a single shell is not a difficult thing to construct. Such floors, if treated as arches, exert considerable thrust, and require heavy walls or ties. Mr. Payne suggested different ways of providing against the thrust: one, by building in an iron ring to take the thrust of a floor, which should be slightly domed. Such a use of iron inside, where it would be protected from extremes of temperature and from weather, is a very different thing from its use in the exterior frame of a building; but it might be an element of insecurity in case of fire. An ingenious plan, suggested by Mr. Payne, was, where there was a large floor supported by columns, to divide it into arches, and, carrying the columns above the haunches of the arches, stay them with ties carried on the upper side at the level of the crowns. But it is by no means necessary that a concrete floor should be arched. The floor of a room of moderate width may be safely made in a single slab or shell, if pains be taken to make a thoroughly strong concrete; and the amount of material required is so much less than that needed for walls, that a builder can very well afford to use the best. A shell of four or five inches thickness in one sheet is strong enough for ordinary domestic use. It may be doubted whether those which are in use, arched with a very small rise, really resist as arches. They probably exert no thrust on the walls, and would not till they were broken: the best way to form them for strength would therefore be to make them thicker in the centre than at the edges. To bow them would be ugly; but they might be made with raised panels to give greater thickness at the middle. The sensitiveness of concrete to concussion is an element of insecurity; but floors of it are probably no worse in this respect than brick arches, and if protected by a boarding, which is necessary for comfort, ought to be, and have been, amply strong for domestic use.

There has been a considerable use of cement for inside finish, — skirtings, architraves, dados, and cornices; and some very fine and hard concretes are in use here, — the Keene, the Teil, for instance, and various others, as well as scagliola, which is a material of the same class. They are of course inferior to stone, but have the same advantages in being incombustible, and are very much cheaper in such positions, since they must be finished and more or less moulded. We do not see why they are not as legitimate in their way as plaster; and they are more agreeable to the eye, as well as more respectable for their solidity. We do not believe greatly in using them upon wood furring; but, if their introduction would encourage the use of brick partitions on which to apply them, it would be a real advantage to the solidity of our buildings, and might lead the way to the freer use of stone in interior work.

THE BEARINGS OF THE PROPERTIES AND FUNCTIONS OF BUILDING-MATERIALS AND OF MOISTURE IN THE GROUND ON DAMPNESS IN OLD AND NEW DWELLINGS.

READ BEFORE THE NINTH ANNUAL CONVENTION A. I. A., BY ADOLF CLUSS, FELLOW.

STRICT regulations are being introduced in our cities to enforce the safety which men as members of civilized society are entitled to demand. Proper safeguards against conflagrations, and guaranties to insure stability and strength are aimed at; but another consideration of equal importance — the hygienic condition of new houses — now presses forward, and demands attention from authorities, architects, builders, and owners, so that the health of the occupants of buildings may not be undermined slowly but unfailingly. The housekeeper justly abhors a damp basement still more than the nuisance of a smoky chimney or a scorching furnace. Due attention used to be paid to the seasoning of materials before their use, and during the progress of a new building. But this has now given way to considerations of a speedy return of income from the capital invested; and means must be found to justify this accelerated activity by rational methods of building. Irrational views have even so far prevailed, that mechanics have been instructed and have undertaken to restrict the application of water in the construction of walls as much as possible, in order to shut out moisture at the start; a most perverted view of the case, as will be shown. The doctors of medicine have sounded the alarm; but it is allotted to our profession to find and apply

the practical remedies. The hygienic purposes of the house are, constantly to maintain communication with the atmosphere surrounding us, and to regulate it according to our wants. Our dwelling should, no more than our clothes, be the means of shutting us off from the outside air. We should object to occupy an air-tight house as much as we should to wear India-rubber clothes and shoes under ordinary circumstances. No walls are air-tight. If they were not in some degree open to the passage of air, we could not live within them for any length of time without injury to our health. Our opinions to the contrary result from the insensibility of our nerves to motion in the air having a less velocity than about twenty inches per second. Nobody claims that our dwellings have absolutely water-tight walls. If they could be dipped in water, water would soon ooze out on the inner face of the walls independently of doors and windows. It cannot be denied, that, where water passes, air, being seven hundred and seventy times lighter and more movable, will follow suit. Dr. Pettenkoffer, Professor of Hygiene in Munich, has blown out lights through fourteen-inch brick walls, by means of proper physical apparatus. Mortar, sandstone, and brick are moderately porous. Dense limestone affords little passage to the air; and it might be assumed that a brick wall would be much more pervious to air than a rubble wall of gneiss. This, indeed, we know to be the case; but not to the same degree that brick and rubble-stone are different in permeability, because mortar regulates the difference to some extent. It may be assumed, that the mortar in a wall built of rubble will be one-fourth, in a brick wall one-fifth, and in a coursed ashlar wall one-ninth, of the cubic contents of the whole wall. The mass of mortar increases generally as the porosity of the material decreases. The effect of moisture in porous building-material is surprising. As the pores are filled with water, they become impermeable to air in consequence of the stronger adhesive power of water. In tracing the causes of dampness in dwellings, we shall have to distinguish between moisture in the building-materials, and moisture arising from the ground. This will lead us to the mode of removing moisture in the building-materials, before and after their use, by circulating air around and through them; and to the use of cement for foundations, walls, and floors under and near the ground.

Practically, in constructing dwellings we have to deal mainly with natural stone, with artificial stone, with wood, and with iron. The other materials are ranged as accessory building-materials, among which mortar plays the most prominent part. Man, in building his house, has primarily resorted to the material of which Nature has formed the crust of the earth. To apply these materials in accordance with the laws of statics and of nature, involves the progress of the science of construction; and to dispose of these essentials, in *ensemble* as well as in detail, so as to produce impressions of harmony and beauty on the cultivated eye, adds the element of art to the profession. A happy blending of these elements of science and of art is the crowning effort of the practising architect. The structural and the chemical properties of rocks are of most importance from the architect's point of view. The geological position has less connection with their characteristics as building-materials, since there are many exceptions to the general rule, that the more ancient rocks are the stronger and more durable. Those species of stone which combine the requisite firmness with uniform durability are principally used. Among natural stones we use granite, gneiss, basaltum, and limestones, which as they approach compact crystalline forms are termed marble, sandstones, and clay slates, of which the North-river blue stone, or graywacke, is a variety. All of them carry more or less humidity in their natural position; but, besides, natural stones often readily absorb water when they come in contact with it or with aqueous vapors. The latter property is of great importance, since there exists nothing which is not in the end destroyed by water; either chemically by solution, or mechanically by the formation of ice or steam. The solution by water proceeds slowly with most silicious stones, such as granite and gneiss, any weakness in them generally arising from the disintegration of perishable material by which the crystalline grains are cemented together. The formation of ice and steam is the most dangerous to the durability of the materials; since water expands when changing its state, and, entering a porous stone, destroys its face by scaling off, especially with sandstone when built with its layers set on edge; in which case, water lodging between the edges of the layers has no room to escape except by the slow process of evaporation.

Even in the remotest antiquity, the problem has been presented, to counteract the decay of stones by means which resist the destructive agencies of air and water most efficiently. Sir Henry Rawlinson says, "The art of hardening stones, i.e., to transform their surface into an insoluble silicate, appears to have been lost, though it was in successful use among the ancients. The raised inscription of Darius Hystaspes, on the rock of Behistun in Persia, has been thus preserved for twenty-four hundred years."

The various processes tried and proposed for the preservation of naturally perishable stone consist in filling the pores of the surface with some substance which excludes to some extent air and moisture without injuring the appearance of the stone; but the efficiency of the means now known, such as soluble glass, have of late been much contested. It is necessary to discriminate whether a stone shall come in contact with air or with water.

Water dissolves, air decomposes: both united exert an increased power. The principle should be maintained, of securing for a building-material either a constantly wet or a constantly dry state. The first will occur with foundations, the latter with stories for occupation. The Egyptians, Greeks, and Romans possessed splendid quarries: still, instead of constructing all their buildings with natural stones, they preferred to mould artificial stones, and even gave them a preference for their dwellings. The cost of working and transporting large stones was, no doubt, one cause: still the inherent humidity of the natural stones has certainly been an inducement to seek a substitute. Natural stones are apt to render dwellings unhealthy, if their properties of absorbing and giving out again moisture are not guarded against; and bad artificial stones even add the difficulty, that they subject any materials with which they come in contact to metamorphoses which impair the durability of the building very seriously. Most artificial stones are manufactured of clay; viz., bricks. These contain, in some cases, salts which are thoroughly destructive, and may cause the decay of stones, and dry-rot in lumber. Ignorance tries sometimes to wash off the exudation of saltpetre from brick walls: this is a mere waste of labor, and does injury by destroying the hard crust produced in burning the bricks. Among artificial stones, bricks will most likely predominate for an indefinite time: having been successfully used during four thousand years, we master this material better than any other. The artificial stones are in general only applicable if they are sufficiently dried. Bricks, being burned, are dry as a matter of course; but still we find plenty of dampness in brick houses.

THE ILLUSTRATIONS.

K. A. LODGE, WILLIAMSTOWN, MASS. MESSRS. POTTER AND ROBERTSON, ARCHITECTS.

THIS building now in course of construction at Williamstown, Mass., is for the use of the Williams College Chapter of the K. A. Secret Society.

The dimensions of the ground plan, not including the piazzas, are 67 x 44 feet. It will be built of red brick, trimmed with light blue stone, up to the level of the second story beams; above this the construction will be of wood. The window-heads will be filled with rolled cathedral glass leaded in geometrical patterns.

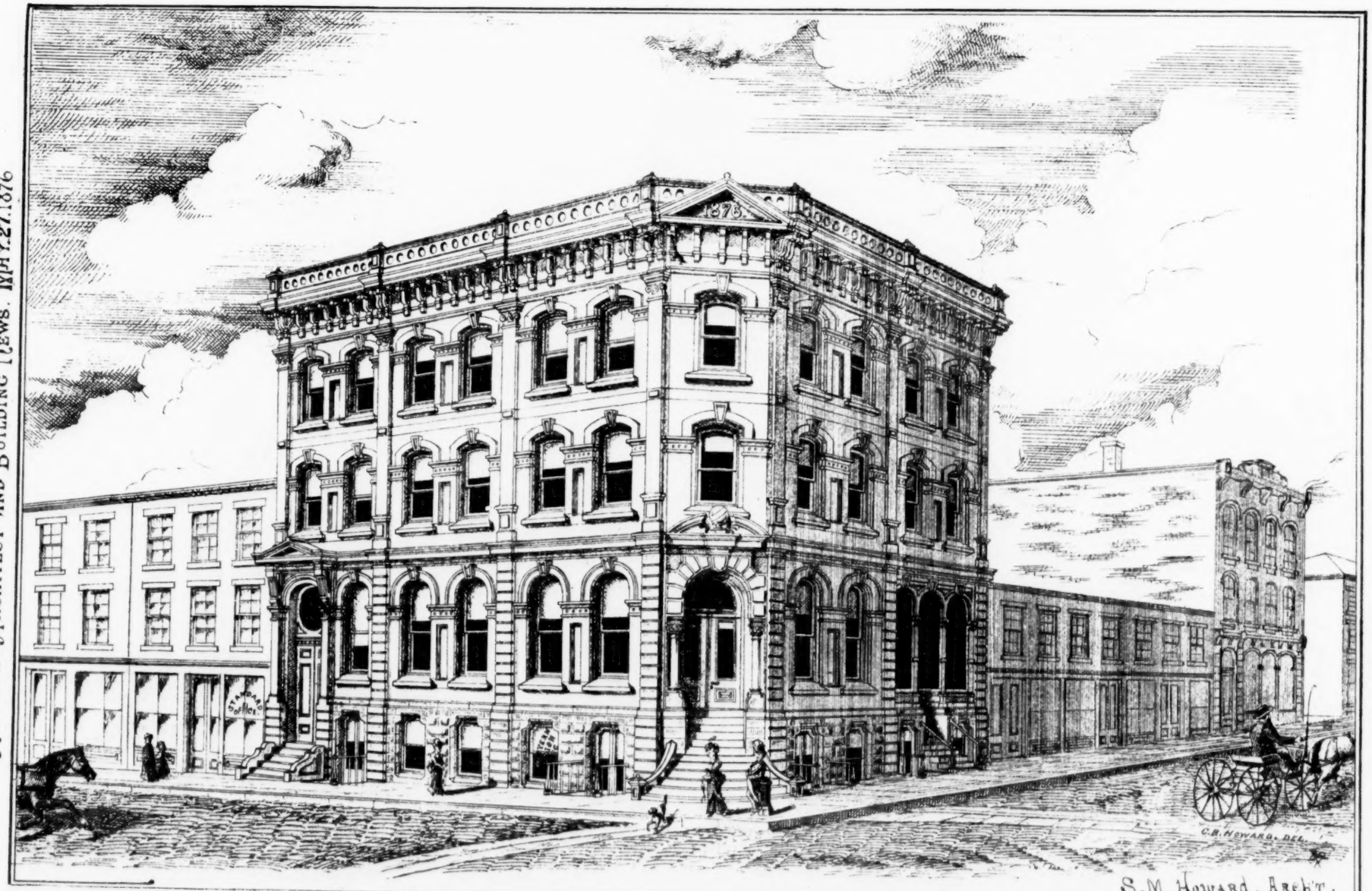
THE "PEOPLE'S BANK" BUILDING, WHEELING, W. VA. MR. S. M. HOWARD, ARCHITECT.

This building is now being erected on the north-west corner of Main and Twelfth Streets, fronting 50 feet on Main, and 65 feet on Twelfth. The basement story, and the entrances and pilasters of first story, are to be of native gray sandstone; the superstructure of brick with pressed brick fronts; cornices of galvanized iron; belt-course of stone. The basement is arranged for Western Union Telegraph purposes; the first story, for banking purposes, with a store-room on the same floor; second story, for offices; third story, for a lodge-room. The money-vaults are to be of stone; the stone anchored together with cannon-balls, and laid in cement.

CHURCH OF THE ADVENT, BOSTON, MASS. MESSRS. STURGIS AND BRIGHAM, ARCHITECTS.

This is the design of a church which it is proposed to erect in Boston.

WALNUT LUMBER. — Of all timber-trees, the black walnut is at the present time believed to be most profitable. Ohio and Indiana have of late years been the great sources of supply. From these States, large quantities have been sent to the furniture factories East. At the present time Kentucky is shipping walnut timber largely. While, however, the older States are being depleted of this valuable wood, the States that may be called timber-planting ones are rapidly coming up with a supply. — *Timber Trades Journal.*



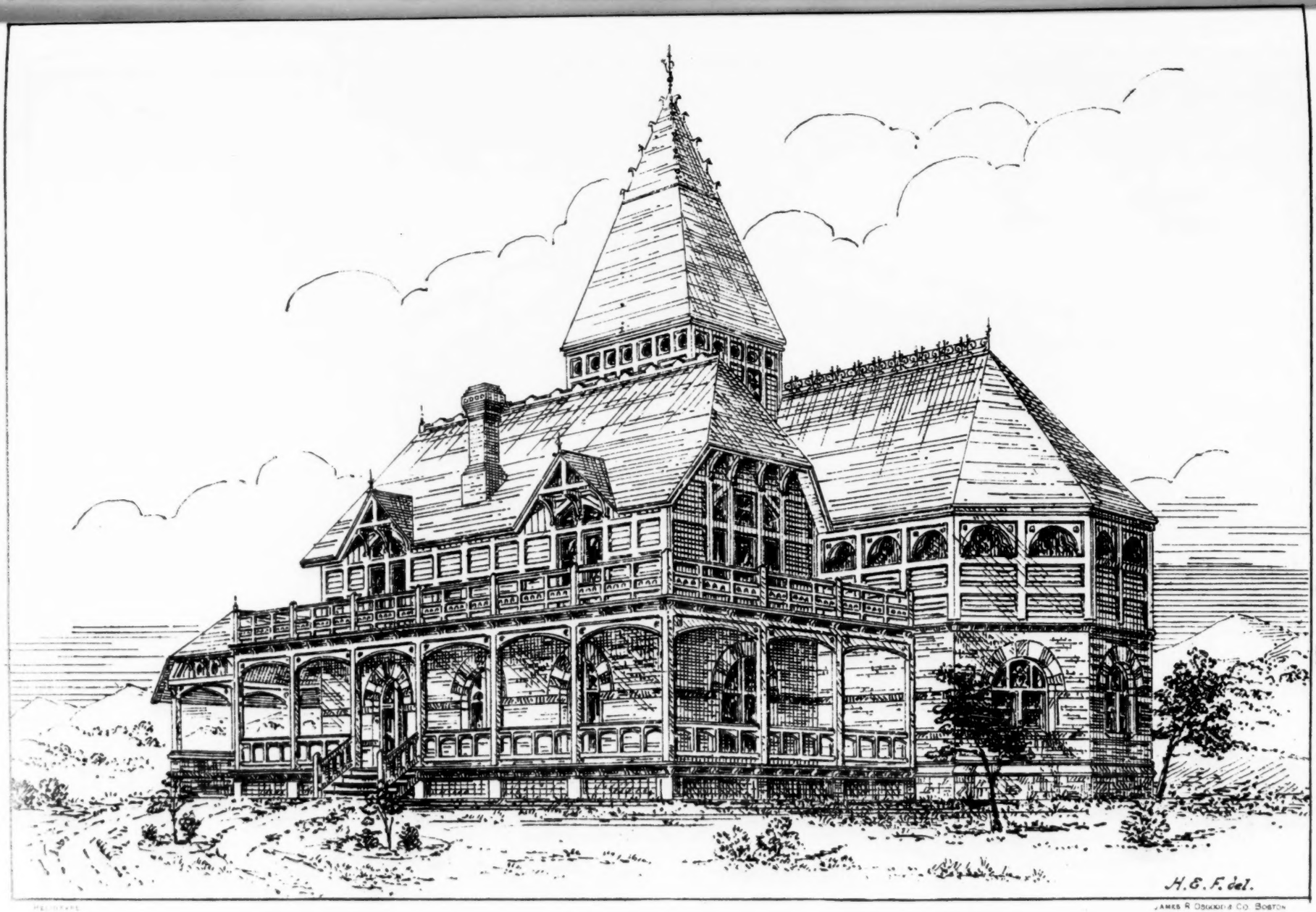
S.M. Howard. Arch't.

DESIGN FOR PEOPLES BANK · WHEELING · W. VA.

AMERICAN ARCHITECT AND BUILDING NEWS. MAY 27. 1876

HELIOTYPE

JAMES R. OSGOOD & CO. BOSTON



JAMES R. OSGOOD & CO. BOSTON

The Kappa Alpha Lodge, Williamstown, Mass.

MESSRS POTTER & ROBERTSON : ARCHITECTS. -

ARCHITECTS
SOURCES BRICKS
BOSTON
PERSPECTIVE
CHURCH ADVENT
BOSTON

HELIOTYPE

OUT-DOOR SKETCHING. — II.

SELECTION OF STUDIES.

THE selection of a sketching ground is not always an easy matter to the architectural student. Even when the purse is long enough to compass all financial questions, it is not impossible for the young architect to make very grievous errors of selection. One of these errors consists in taking too high a flight. Some mighty minster is fixed on for our holiday study this year; next year it is a huge towering castle; the year after, an episcopal or baronial palace; and so it comes to pass, that much of even our leading architects' ordinary work is stilted, not to say affected. How often must it be repeated, that the English architect's every-day work in these times is not to build castles or cathedrals? Indeed, how very few there are who have experience, even genuine modern experience, of palaces; for the bishop and the baron are not, as a rule, lodged now in palaces. When it happens that we have a palace of art or palace of justice to build, — palaces really palatial in character and purpose, — we can go no further than we have already gone, having exhausted our powers of the palatial on linendrapers and licensed victuallers. If, however, your connection is an influential one in high quarters, you would do well not to neglect altogether the study of such buildings as cathedrals and palaces. The Italian Renaissance palaces, sometimes very much reduced in scale, have supplied the architects of our London clubs with designs and details: they have also supplied the architects of insurance companies. To these structures we owe our royal palaces called Buckingham and Osborne: we also owe to them the Manchester warehouse, the railway station, the vestry hall, and the public-house. The same general ordonnance, the same detail, almost the same dimensions of door and window, may be found in the buildings here named, although erected for such diverse purposes. Our own mediæval palaces at Wells, Westminster, and Hampton, and the great French châteaux, especially that at Blois, have been well worked, and have been used up indifferently for town and country houses, for guildhalls, almshouses, and law-courts. Even the Venetian palaces, built in a fashion peculiar to the city of the sea, — a fashion which stood alone from all other mediæval fashions, as it never moved beyond the precincts of the city that gave it birth, — even these have been, so to say, dragged from their tombs to be mocked in London streets as insurance offices or restaurants. If you think that you certainly will be called on constantly to design cathedrals and palaces, and such places as clubs, banks, town halls, law courts, and government offices, which are all of the nature of palaces, it would be well to see what you can of the greatest and most important structures of Renaissance and Gothic art in Europe; not merely in your early student days, but every year, even when in the full flood of professional engagement. But if, as is much more commonly the case, your architectural practice is likely chiefly to lie among schools, suburban villas, country houses, churches, and chapels, you will be all the better for not crowding your mental art-gallery with gorgeous pictures which can never be of any real service to to you, but, on the contrary, only tend to make you an architectural caricaturist. The large number of sad examples of this course of study, which London, Manchester, and nearly all our large towns exhibit, is painfully depressing. Nor is this stiltiness by any means limited to the nobodies of the profession. There are men who take high, I may say the highest rank, whose suburban villas are the offspring of baronial castles by palaces of justice, whose English hotels are nourished on foreign cathedrals, and whose country houses are clothed in the second-hand toggery of the mighty town-halls of mediæval guilds. But you must be careful not to fall into the dangers of Scylla, in steering clear of Charybdis. The impatience some artists have felt towards the stilted grandiose architect, with his unbending and unbendable blank-verse compositions, has led to the opposite extreme; and there is therefore the danger of a re-action, whereby the commonplace brick and tile and wood construction, so admirably suited for the commonplace, may also be pushed beyond its proper limits, and our palaces, guildhalls, clubs, banks, and such like be starved into the likeness of the country town inn, the manor place, and the farmhouse. Nevertheless, for *early* study, it is these places you would do well to select. When occasion arises for you to design a large town hall or other important public building, there is always time for a few days' trip and a special study, if you require it. To find the class of building to which I would direct your attention, you cannot have far to travel. The country town inn, the manor, and the farmhouse, though not so plentiful as they were at the beginning of the century, are yet not so rare but that pupils or assistants of the most economical turn of mind may manage to reach them. Were I a pupil at Leeds or Bradford, it would take a long time to tire me of York. The architectural food to be found in its narrow streets and back courts (I am speaking of ten years ago) is altogether nourishing and wholesome, and very unlike the over-spiced rich dish which towers over every thing in the city. I can conceive nothing more depressing in the way of sketching than to carry out in York the Pecksniffian order as touching Salisbury, — to sketch its cathedral from every point of the compass. The huge building has its merits: what large old building has not? But, apart from size, all other merits must be searched out; for they are by no means so very apparent as people would have us think. The cathedral lives in popular favor; and by popular favor its gaudiness has outlasted many a better example of its own type, and many a nobler specimen of a higher type of mediæval art: so, with an eye to business hereafter, young students should think twice before they disregard a popular prejudice, and be especially careful not to do violence to the art opinions of local dignitaries *in esse* or *in posse;* and the student's policy should be, to steer clear of criticising, either directly or indirectly, their art leanings.

In all your selections it should be remembered, that, the mediæval revival having reached its limit, the future order of the day, if there is to be any order at all, will not be to blindly follow any given or past condition of architecture, — Greek, Roman, Renaissance, or Gothic, — but to follow ART. For this you will require an artist's training, and not a stylemonger's. You must above all, as I said in my first article, learn to look, then to criticise; and by criticism I do not mean a volley of vituperation or an avalanche of ecstasy, — the only two views of criticism possible to many people, and especially to professed critics. When I ask you to criticise, I mean that, before selecting a building for study, you should weigh well the nature of its merits, and probe the depths of its failures or demerits. Of the site and its surroundings, their nature when the building was erected, their nature now, you should know and note. A house that might look wholly admirable in the narrow street of five or six yards' width, for which it was designed, might very possibly look absurd in an open square; and contrariwise. In selecting subjects for study, you may, as I have already said, find towns with good examples of each of the three kinds of ordinary construction, — stone, brick, timber. Yet, whenever you have the opportunity to see a town where one kind of construction has been so dominant as to have practically excluded the others, you should be careful not to miss it. If you wish to study stone architecture (it matters not in what style), take the West of England, and the valley of the Nene, the West of Normandy, and the valley of the Loire, for your chief hunting-ground. If brick architecture is the object of your pursuit, the eastern counties, particularly Essex, may do much for you. Holland is not far off, and may be taken as a supplement to Essex. For timber construction, go to Cheshire and Warwickshire, and after that to Lisieux and Rouen. But, as Bayeux and Bath are cities of stone, so Lisieux, Coventry, and Chester are towns of wood; and in these towns you may select the most representative buildings from scores of examples. The student who has made up his mind as to the scene of his future practice, or who may possess family influence in any special locality, had, however, better thoroughly grasp the natural and architectural characteristics of that locality, and do his best for its artistic development, than go wandering after fresh fields and pastures new. — *The Architect.*

REPORTS OF MEETINGS, A. I. A.

BOARD OF TRUSTEES.

AT a special meeting, held March 28, sealed ballots for candidates were opened. The Secretary made a statement in behalf of several members of the Philadelphia Chapter who were opposed to the election of two of the candidates. After remarks made by the Secretary and others, the nomination of the said candidates was confirmed. After the ballot, Mr. George A. Fredericks of Baltimore, late Associate; and Messrs. Schwarzmann and Kafka of Philadelphia, — were declared Fellows.

At a special meeting held April 18, correspondence that had passed between the Secretary and others, in reference to the character of a candidate for Fellowship, and to the status of an Honorary Member engaged in the superintendence of architectural work, was presented.

NEW YORK CHAPTER.

At the regular business meeting, held May 2, the Secretary reported concerning the arrangements made for the reception and

hanging of the contributions made to the Centennial Exhibition by members of the Chapter. He stated that one hundred and twenty-five framed drawings had been contributed by twenty-three members. The report was accepted, and a vote of thanks was voted to Mr. Walter, President of the Philadelphia Chapter, who had offered to personally supervise the hanging and arrangement of the said drawings. A communication dated April 17, from the President and Secretary of the Metropolitan Museum of Art, was read, returning a grateful acknowledgment to the Chapter for its gift of a collection of Central American pottery, &c. The Secretary presented several letters addressed to him by Mr. Fuller, architect of the New York State Capitol, together with several accompanying copies of letters addressed to Mr. Fuller by Lord Monck, Governor-General of Canada; Joseph Cauchon, Speaker of the Canadian Senate; and John Page, Chief Engineer of Public Works, Canada, — giving the facts of Mr. Fuller's connection, as architect, with the Government Buildings of the Dominion of Canada. Copies of resolutions passed by the Rhode Island, Chicago, and Philadelphia Chapters, indorsing the remonstrance addressed to the Senate of New York by the New York Chapter, were also presented. It was voted, that, inasmuch as these documents were of general and not merely of local interest, they be referred to the Board of Trustees of the American Institute of Architects.

The Secretary presented a printed document addressed to the Chapter, by Frederick Brooks, L. Frederick Rice, and Clemens Herschil, a committee of the Boston Society of Civil Engineers, on the subject of the Metric System; and moved, that inasmuch as the subject had been exhaustively discussed at the last Convention of the Institute, and there laid on the table, and inasmuch as Mr. Haight had introduced the subject at the Convention, that the document be referred to him as a committee of one, to consider and report on to the Chapter, previous to the next Convention of the Institute.

The Secretary called up the question of co-operation with the Mechanics' and Traders' Exchange, and the Master Carpenters' Association, in the proposed plan for the establishment of a Committee of Conciliation and Arbitration; and presented the signatures of forty-two architects to the following printed statement: —

"The undersigned, having duly considered the fact, that, owing to the delays of courts in matters of dispute arising from and connected with building operations, great inconvenience, pecuniary and otherwise, is experienced by the community; and believing that, in the majority of cases, such disputes might be amicably and promptly adjusted by a Board of Conciliation or Arbitration, composed of disinterested building experts, hereby express their desire to see such a Board properly organized."

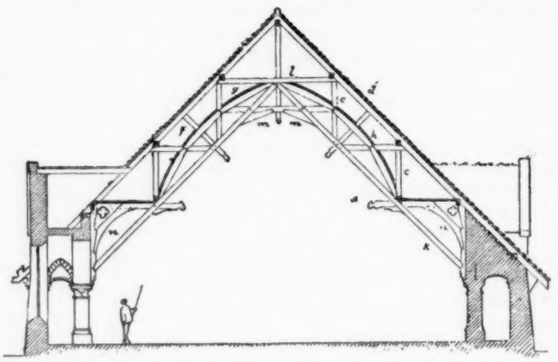
After discussion, the matter was laid on the table. A committee of five was also appointed to consider what provisions should be introduced into the building laws of the city of New York, with reference to public health.

THE ROOF OF THE GYMNASIUM AT HANOVER.

AMONG the interesting things observed by M. Félix Narjoux while making a tour through the North-west of Europe, was the gymnasium at Hanover, of the manner of constructing the roof of which we give a short account nearly in his own words: —

In the rear of the building is the large hall for exercises, ninety-three feet in length by ninety-one feet in breadth. It is divided into eight bays of thirteen feet each, except the two end bays, which measure only six and one-half feet, and which support a gallery reached by stairs from the first story. This hall is covered by a roof which is framed in the most curious manner that can be imagined. The arches which separate the nave of the hall from the aisles take their rise from isolated stone piers, which are only nine feet nine inches high. The aisles, which are very narrow, being only four feet wide, are covered by a barrel vault, while an inferior arch connects the piers with the exterior wall, which is only eighteen inches thick, but which is strengthened by buttresses. This is, as we see, exactly the combination adopted in certain French churches of the middle ages, as in *La Souterraine* (*Creuse*), for instance; but, except in the nave, resemblance between these edifices does not exist; for, instead of the vault of solid masonry which covers the French building, an open timber roof of a peculiar construction is placed over the German building.

The tops of the piers are, as we have said, nine feet nine inches from the ground; while the ridge-pole is fifty-four feet from the ground, and is fifty-nine feet distant from the top of the wall. To build an open timber roof of such dimensions, without introducing any intermediate point of support, was a really difficult problem, which the Hanoverian architects have solved in an exceedingly intelligent way. Projecting from the top of the wall is a hammer-beam, *a*, which is supported by a brace, *k*, forming with the wall and the under side of the hammer-beam a right-angled triangle; above the hammer-beam this triangular form is repeated again and again by means of verticals, *c*, and struts, which support the principal, *d*; the brace, *k*, forming the hypothenuse of the lower triangle, is prolonged as far as its intersection with the king-post, *b*, and forms with the principal a system which the series of triangles renders rigid, and prevents any possible deformation. In order to obviate the inconveniences arising from the changes of temperature, a wooden barrel-vault of pine sheathing, *f g h*, has



been inscribed on an arc occupying the space between the outer and inner principals: this by its form and its importance serves as a decoration to the hall, though unfortunately the upper portions are obscured because of the deficient lighting arrangements. The thrust exerted by these heavy trusses and the roof they support is perfectly sustained by the piers, which, as we have said, are tied to the walls and buttresses.

No deformation either in the vaulting or in the trusses is discoverable. It would have been easy, it will perhaps be said, to have reached an analogous solution by the employment of iron. To this reply can be made, that the use of iron would have been more expensive, and moreover, considering the conditions of the problem, it would not have allowed of the building of a roof protecting from heat and cold as well as the one adopted: thus a zinc roof, under such conditions, is a poor protection when it is not re-enforced by auxiliary boarding; a glass roof would have been too hot in summer and too cold in winter, and, moreover, might have been obscured by snow at the very time when the light it ought to give would be most needed; a tile-roof would have demanded iron rafters and purlins of very large dimensions, and consequently would have been very expensive. Finally, when we behold the result reached, we cannot dispute the right of the Hanoverian architects to construct the roof as seemed to them to be most proper, and to prefer wood which they found directly under their hands, to iron which they would have had to procure from a distance and at a high price.

OPTICAL ILLUSIONS AS AFFECTING ARCHITECTURE.

TRANSLATED FROM THE GERMAN OF J. LANGL, BY M. G. VAN RENSSELAER.

A PAPER of the highest interest has appeared under the above title. It is from the pen of A. Thiersch, Docent in the Royal Polytechnic at Munich; and in it the author critically exhibits the different prevailing views as to the so-called "optical corrections" in the temples of Greece.

Penrose, by carefully measuring the buildings of the Acropolis, established with the utmost precision the curvatures of the horizontal parts, already noticed by Pennethorne and Hoffer. Since his time, discussions have always been rife in the scholarly world, upon this discovery in ancient architecture. Further examinations could only serve to confirm the existence of the fact. What might be the cause of the optical illusion experienced by the Greeks, and what laws they observed as a means of correcting it, still remained open questions. The delicate appreciation of the Greeks for rhythm and proportion had always been a marvel to us: we could not wonder, then, that their eyes, so susceptible to impressions of form, should feel the optical illusions of architecture, infinitely slight though they might be. It was equally natural, that they should try to find some counteracting remedy. To-day

opinions as to the "wherefore" are still conflicting; and even the author of the above-named article does not put a positive end to the matter. Nevertheless the careful juxtaposition, by pen and pencil, of all available materials which we find in Thiersch's work, is calculated to incite the reader to reflect for himself, and to continue the train of thought that has been started on the subject.

The hypothesis of Hoffer, that there exists a universal repugnance to the stiff abstractness of the straight line, and that the Greeks desired to carry into their buildings the living beauty of Nature who knows no rigid mathematical lines, is in certain aspects justifiable; but it does not touch the heart of the matter. The lines are not curved in order to appear curved, but the straight lines are bent only that they *may appear straight;* for, if they *were* straight, there would seem to be a false curvature in the opposite direction.

The views of Penrose touch the point more nearly. He starts from the correction of the pediment where the impinging of oblique lines on a straight one makes the illusion more striking. Kugler and Julius Braun discover in the curvatures a certain elasticity of form by which the weight, the burden, becomes, as it were, etherealized. They thus conceive, however, of the inflections as being actually visible, which they are not. We merely feel them unconsciously in the appearance of the straight lines as correcting an optical illusion.

Vitruvius's remarks on optical corrections show that the only author whose works we still possess, on the architecture of the ancients, was himself not in the secret of the true cause of them. Two remarks quoted by Herr Thiersch from Schweider's commentary on Vitruvius (Heliodorus and Philo) only confirm the fact that the sensitive Greek eye recognized the optical inaccuracies, and sought to neutralize them by contrary curves. To enter into a consideration of the causes of such illusions, must necessarily, in the then condition of natural science, have been far from their minds. They created according to their æsthetic sense, and concerned themselves no further about the secrets of the eye.

It is, however, an incontrovertible fact, that our organ of vision is not formed by nature for the projection of geometrical forms. Just as incorrect as it is from a mathematical standpoint to paint a picture for our eye on a flat surface, just so false, on the other hand, appear systems of parallel straight lines on the concavo-spherical surface of the sensitive retina. The central projection by the lens will draw the plane surfaces of parallel lines in meridianal lines, which, diminishing conically, or rather in a pear-shaped manner, will have their pole in the centre of the lens itself.[1] Did we perceive them as depicted on the retina, all parallel straight lines would of necessity appear as converging curves, if we except the one which lies in the axis of the lens itself. But consciousness trained by experience shows us the lines as parallel; and every means of correction which would construct the picture on our retina as it exists before us in nature, would be felt by us as faulty. Empiricism is, on this point especially, the only correction; a subjective judgment of our own powers of sight remains excluded. Only a man born blind, and suddenly endowed with sight, could give an account of the actual pictures on the retina.

By the arrangement of our organ of vision, perspective foreshortening also becomes perceptible. Perspective must not be reckoned among those optical illusions which are concealed or unfelt through the force of habit. It must be regarded as an independent mathematical system, the illusions of which are not removed by experience. Indeed, the consciousness must, on the contrary, be from the beginning educated by these illusions to the perception of them. The child grasps at the star as at the adjacent candle, knowing nothing of distances: experience first teaches him to measure them, although the system of perspective foreshortening acts in the same manner upon the eye at all times of life.

When the horizon of our eye is between two (for example, horizontal) parallel straight lines, these will appear, in their prolongation towards the infinite, as curved lines concave towards the horizon. The nearer we approach the eye towards the plane in which the lines lie, the more steeply will they fall off towards their vanishing-points. If we cut out a section of these parallel lines at any distance, by perpendiculars, for the side view of a Grecian temple (for the lines of steps and entablature), the straight lines will appear as sections of that curve, which, as already stated, will be more noticeable when it lies near the eye, and less noticeable the nearer it approaches to the vanishing-point. And this effect will be produced whether we stand exactly opposite the façade, or whether it lie at a sharp angle in the distance right or left, towards the vanishing-point.

We are, however, accustomed to receive on our shell-shaped retina all straight lines as curved lines, narrowing meridian-wise to the lens. To this inflection of the lines, caused by the central projection, are added in short sections of straight lines the delicate *nuances* of the curves that arise from perspective. These increase, as it were, the fault arising from the shell-shape of the retina in relation to the projection of straight lines; they must, however, be distinguished as founded on fact. It is not impossible, that, from this coincidence of two different effects on a sensitive organ, arise the illusions to which the Greeks opposed their corrections. The curves of perspective fall in the curves which we feel on the retina as straight lines, and are, so to speak, absorbed by the force of habit. We lose thereby, however, the delicate effect of the foreshortening of straight lines, viz., the gentle curve towards the horizon; and this leads to the illusion. The lines no longer appear straight, but seem curved in the opposite direction. Nothing, then, but a swelling of the lines in the direction of the perspective curve, thus, as it were, aiding, intensifying the perspective, can neutralize the illusion by another illusion.

What is here said especially of the horizontal can naturally be taken also as applying to perpendicular lines; for the arrangement of the eye shows no difference, except in the rather smaller angle of vision.

Were the eye, that is, the organ by which we perceive the light, constructed differently from the way we now find it, perhaps so that the perceptive nerves stood in direct contact with the outer world, one might imagine a perception of objects quite different from that caused by the apparatus of lens and concave sensitive surface which produces the deceptions of perspective. A more correct appreciation of straight lines might be possible. But Nature has so managed in the construction of the eye, that the straight line is to it no symbol of endlessness, but every thing resolves itself into curves. The land of the Horæ, yes, all existence, finds its counterpart in the circular line, always returning upon itself.

The exact analysis of the curves in which straight lines appear on the retina, and the examination of the disturbances in individual perception, would supply an interesting chapter, useful towards clearing up many questions relating to optical illusions, and of great value to the anatomist as well as the artist. As the poet maps out his drama upon paper, and must calculate the effect of its representation, so also must the architect know beforehand the secrets of the forms that first become visible in the solid erection.

We are far from claiming that these few lines establish a satisfactory hypothesis. We have but attempted to open the way for researches in a field that most certainly conceals the answer to many riddles. It only needs a fortunate explorer to widen our artistic knowledge, thus bringing art itself nearer to perfection.

[1] There is evidently something wrong here. We have not been able to find a copy of the original. — ED. AMERICAN ARCHITECT.

ENGLISH NOTES.

SIR GILBERT SCOTT has yielded his position as President of the Royal Institute of British Architects, to Mr. Charles Barry. Although the former gentleman's practice has grown to an enormous extent, yet in the midst of it he has rarely failed to preside at the meetings of the Institute. A word of his in reference to the Worcester Guildhall may not prove uninteresting: "It is a genuine specimen of a style which has done especial credit to the English school of architecture, and which owed its development in a high degree to our distinguished architect Sir Christopher Wren, and which is at the present moment honored and cultivated by a large class of our best architects under the name of the style of Queen Anne."

A barrister lays down in the Architect thus briefly the law of fixtures: "That which has been added to a freehold for the purpose of benefiting the same, cannot again be removed without permission of the owner. *Vice versa*, if no such intention can be presumed, the fixture can be removed at the will of the annexor of the same."

The increase in the population of London, formerly doubling every forty years, has of late received a check, as is especially shown in the records of new houses built. In 1865 the number reached eighteen thousand, and in 1874 sunk to seven thousand seven hundred. A writer in the Builder makes the working classes much to blame for this, and attributes it in part to the eight-hour system and to strikes. It is proposed to lay out in the North-western part of London a boulevard three miles in length, somewhat after the fashion of the Champs Elysées. D.

NOTES AND CLIPPINGS.

CHARCOAL FIRES. — Tinsmiths, roofers, and plumbers have been the cause of so many fires, that some action should be taken to put a stop to their carelessness. Charcoal is undoubtedly the combustible the most easily ignited, and, weight for weight, gives more heat than any other combustible; but there are others which will do its work nearly as well and at a less risk to the surrounding buildings. Uncovered brasiers, usually improperly balanced, are another frequent cause of accidents. If the tinsmiths at work on the 1st inst., in repairing the roof of the Baptist Church at the corner of Lee Avenue and Wilson Street, Brooklyn, had made use of a covered brasier, or if they had used coke instead of charcoal, lighted coals could not have been blown out of the brasier amongst the rafters of the ceiling below, and the partial destruction of the church would not have taken place. It would seem that some portion of the loss, which was ten thousand dollars, ought to fall upon the tinsmiths.

MEMORIAL CHURCH. — Mrs. A. T. Stewart has lately selected a site at Garden City, Long Island, for the erection of a memorial church to the memory of her husband. A tomb in the church will contain the body of Mr. Stewart.

HEMPSTEAD PLAINS. — A number of car machine shops, with houses for the operatives, are to be built on Hempstead Plains. It is expected that the estate of Mr. A. T. Stewart will annually expend about eighty thousand dollars in connection with the machine-shops.

COURT-HOUSE. — The Grand Lodge of Freemasons of Rhode Island recently laid the corner-stone of the new Court-House for Providence County.

ABATTOIR ON NORTH RIVER. — The butchers on the west side have submitted to the Board of Health plans for an abattoir to be erected on the North River front, between Thirty-ninth and Fortieth Streets, New York, so as to concentrate the business in this locality. The plans, which are not yet complete, were approved; and work on the structure will soon be begun.

A HOTEL SINKING INTO THE EARTH. — Considerable excitement was created in East St. Louis a short time ago by the discovery that the Belleville House, a two-story frame building just south of the Pittsburg Railroad and Coal Company's dike, near the southern limits of the city, had disappeared in the quicksand. The circumstances connected with this unusual occurrence are as follows: The house, which is used as a hotel, was built on piles; but, a few days before, had shown evidences of an inclination to sink into the earth. On Thursday night, it sunk about two feet; but the proprietor, Mr. F. Decker, not apprehending any thing serious, paid very little attention to the matter. On Friday night, the guests went to bed as usual; but at a late hour the clerk, Mr. George Huebner, discovered that the premises were getting rather unsettled, and gave the alarm. Before the inmates could realize what was going on, the building had sunk forty-eight feet, carrying with it ten persons. After considerable difficulty they were all rescued, badly frightened, but not hurt. The back-water from the river soon surrounded the place where the house stood, and would very probably have carried it away if the gable end, all that is visible, had not been securely fastened with ropes to *terra firma*. The loss on the building is about six thousand dollars. — *St. Louis Journal.*

MONEY WELL SPENT? — There is now nearing its completion in Calvary Cemetery, New York, a marble monument for Mr. William Radde, which, when finished, will be one of the largest of its kind in the world. The marble was imported from Italy, and rests on a granite base weighing fifteen tons. It will be sixty-five feet high, and will cost fifty thousand nine hundred dollars.

WASHINGTON MONUMENT. — A writer in the Chicago Tribune suggests that the entrance-money received at the Centennial Exhibition on the Fourth of July be given by the commissioners to help to complete at least the shaft of the Washington Monument.

THE OLD SOUTH CHURCH. — The full bench of the Supreme Court has granted the petition for leave to sell the Old South Church edifice.

ARCHITECTURAL LIBRARY. — Cornell University, Ithaca, N. Y., contains about one thousand volumes on architecture, which were presented by the President, the Hon. A. D. White.

ORNAMENTAL LAMP-POSTS. — The Mayor of New York has approved a resolution passed by the Board of Aldermen, providing that hereafter no ornamental lamp-post shall be erected in any of the streets, avenues, or public places in that city, which shall exceed at the base, eighteen inches diameter.

CENTENNIAL SCENES. — The Tabernacle Lay College of Brooklyn has been hired by a gentleman who proposes showing illuminated views of the scenes that transpire at the Centennial. He also hopes to show illuminated views of all important objects exposed at the exhibition, accompanying the views with verbal explanations.

A PULLMAN PALACE. — George M. Pullman of Chicago, the president of the Palace Car Company, has finished a dwelling in that city which has cost three hundred thousand dollars.

PLATE-GLASS. — The Lloyd's Plate-glass Insurance Association is said to be succeeding beyond the expectations of the managers. This company insures plate-glass for a premium of three per cent against accidental breakage only; breakage by fire being covered by the ordinary fire-insurance.

LENOX. — Col. George E. Waring, jun., has been appointed by the Sewer Committee of Lenox to make a plan for the drainage of the town.

AQUARIUM. — The fact that the Brighton Aquarium, after having paid all running expenses, annually pays its stockholders ten per centum on their investment, may well encourage the New-Yorkers in their scheme of establishing an aquarium in Central Park. There are aquaria in several Continental cities which are not too far removed from the seaboard; but in England they seem to be more fully appreciated than elsewhere. The new Westminster Aquarium was opened this year; and now Plymouth is proposing to build a large one. The Brighton Aquarium, which is larger and better equipped than any other, was opened in 1872. The building is a long low structure 715 feet long, and 100 feet broad, situated at the foot of a cliff, and on a level with the adjacent wharves and piers. The façade, which is composed of five arches with terra-cotta columns and enrichments, is only eighteen feet high, and is treated in the Italian style. The vestibule of the building is used as a sort of reading and reception room; but even here vases and small tanks show the nature of the building. A long corridor opens from the vestibule, lined on either side with tanks of different sizes. The largest ones, in which such large fish as sharks, porpoises, and seals are kept, measure 100 feet in length by 40 feet in breadth, and hold over 100,000 gallons of sea-water; while the smaller tanks measure only ten feet by eleven. The roof of this corridor is vaulted with groined vaulting of variegated brick, and is supported on columns of Bath stone, polished serpentine marble, and Aberdeen granite, the capitals of which are decorated with sculptures of marine subjects. A second corridor is devoted to the exhibition of fresh-water specimens. Immense tanks holding about 5,000,000 gallons of water are situated under the floors of the corridors. Steam-engines keep these tanks supplied with salt water pumped directly from the sea, and keep the water sufficiently aërated by forcing a stream of compressed air in from the bottom of the tanks. Although the water used is drawn directly from the sea, and is supplied with the necessary oxygen by pumping in compressed air, it is less pure than, and consequently not so well suited to sustain the life of the occupants as, the water in the tanks used at the Crystal Palace, London, and also at the inland city of Manchester, where the water is not so constantly renewed, but is kept pure by constant circulation, and only as much distilled water is added from time to time as will supply the loss caused by evaporation. Some such method of purifying the water must be adopted for the proposed aquarium in Central Park; for if, as its situation near New York Harbor would at first sight seem to suggest, water should be pumped directly from the harbor to the tanks, it would be as impure as the water at Brighton; and, being further removed from the influence of the Gulf Stream, the water pumped into the tanks in winter would be too cold even for most of the fish of our own coast, while tropical fish would find even the water pumped in in the summer almost too cold to live in. Any attempt at warming the water would be attended by very great expense. If it should be found necessary to heat the water, it would seem that the method of warming the water for the swimming tanks of the new Public Baths at San Francisco (which we described in No. 10) would give a very satisfactory result, at a moderate cost; moreover, any other mode of heating the water would tend to drive from it the oxygen needed to support the life of the fish and other specimens, while by the method here suggested it would become more fully impregnated with oxygen than in any other way. The only city in the United States, so far as we know, that at present has an aquarium of any considerable size, is San Francisco.

LANDING STAGES. — The immense landing stages at Liverpool are completed. The docks of the port now cover an area of four hundred and twenty acres, and form a continuous line of more than six miles in length. Their value is twenty millions sterling.

ROMAN TOMB. — A Roman tomb was recently opened at York, England; and, enclosed in a stone coffin, was found the body of a young girl, admirably preserved by the use of gypsum.

LIBERAL APPROPRIATION. — The municipality of Paris has voted 120,000,000 francs for the public works of the ensuing year.

UNIVERSITY OF ALCALA. — The once famous University of Alcala de Henares, in Castile, is now in ruins. It was founded about 1510 upon a tributary of the Tagus, by Cardinal Ximenes de Cineros, who, being cardinal of the rich see of Toledo, was enabled to erect college after college, so that before the end of the sixteenth century Alcala rivalled Bologna, Salamanca, and Oxford in its architectural beauty and in its appliances for study. The architect of the original building was one Master Gumiel, who was called El Honrado, — the Honored, — because he was never known to have exceeded his estimates.

DISCOVERIES NEAR BERLIN. — The city of Berlin having recently acquired some domains hitherto belonging to the Crown, a casual inspection of the ground led, by chance, to the discovery of an ancient Wendish place of interment. Stone structures have been found; and the excavations have already brought up a number of urns, some of them containing small bronze implements. A great many of the urns were injured; but a whole row of them, in excellent preservation, has been conveyed to the "Märkische Museum."

GREASE. — An exchange says that the accumulation of grease in drains fed from kitchen sinks may be prevented by the plentiful use of washing-soda or other strong alkali.

ANCIENT MOSAIC. — Portions of a very fine mosaic, about forty feet square, have been discovered at Pouqueure, near Angouleme. It is a work, apparently, of the fourth century.